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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,744	08/30/2001	Charles A. Howland	W0490/7028 RJP	8554

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EXAMINER
PIERCE, JEREMY R

ART UNIT	PAPER NUMBER
1771	

DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/943,744	HOWLAND, CHARLES A.	
	Examiner	Art Unit	
	Jeremy R. Pierce	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *138-198* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *138-198* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 22, 2003 has been entered.

Response to Amendment

2. The amendment filed April 22, 2003 amends claims 138, 169, and 170. The amendment overcomes previous 112 and 103 rejections.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 138-191 and 194-198 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. (U.S. Patent No. 6,534,175) in view of Howland (U.S. Patent No. 5,565,264).

Zhu et al. disclose a cut resistant fabric made with at least one bundle made of yarns comprising two different strands (column 1, lines 18-24). The strands are twisted so that they are normal to the cross-section of the yarn (Figure 2). Although the fabric is used in protective clothing, Zhu et al. fail to disclose the weave density of the fabric. Howland teaches densely woven fabrics useful in the manufacture of protective clothing (abstract). Howland discloses that improved penetration resistance is attained by weaving high modulus multi-filament yarns with a cover in excess of 100% at the center of the fill yarn and in excess of 75% between two warp ends (column 2, lines 5-20). Howland does not disclose a "round packed cover factor" of 75% on the fill yarn and 26% on the warp yarn. However, "round packed cover factor" is only an alternative method for expressing the cover of a fabric. Since Howland already disclose densely woven fabrics, with a cover factor of up to 140% (column 4, line 59), the Examiner will assume that this cover value is in line with the "round packed cover factor" that the Applicant now claims. If not, it would have been obvious to a person having ordinary skill in the art to provide a fabric with the "round packed cover factor" that is claimed in claims 138-140, since doing so would simply be optimizing the density of the weave to provide a fabric with a desired penetration resistance. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It would have been obvious to one having ordinary skill in the art to weave the fabric of Zhu et al. with a fill yarn round packed cover factor of at least about 75% and a warp yarn round packed cover factor of at least about 26% in order to increase penetration resistance, as taught by Howland.

With regard to claims 141 and 142, yarn 3 may be made of aramid fibers, and yarn 4 may be made of metal fibers (column 2, lines 5-20). With regard to claims 143 and 144, the yarns may be made from fiber bundles. With regard to claims 145 and 146, the yarns may be plied together (column 5, lines 13-15). With regard to claims 147-149 and 153, the metal fibers and aramid fibers listed in Zhu et al. (column, lines 57-66) would have a tensile breaking strength of at least 10 g/Denier. With regard to claims 150, 151, 154, and 172-176, Zhu et al. disclose the yarn may also comprise yarn made from cotton or nylon (column 2, lines 9-10). With regard to claims 155-161 and 187, Zhu et al. disclose that inclusion of weaker fiber materials may diminish the cut resistance (column 2, lines 9-11). It would have been obvious to one having ordinary skill in the art to have at least 85% high tensile strength filaments in the yarns in order to maintain sufficient cut resistance in the fabric. With regard to claim 164, Zhu et al. disclose the yarn may have a linear density of 300 to 2000 dtex and that the individual filaments or fibers have a linear density of between 0.5 and 7 dtex. Therefore, an embodiment with a fiber bundle containing 60 to 100 fibers would be inherent. With regard to claims 165 and 170, Zhu et al. disclose the strands without metal may have a linear density of 100 dtex, formed from staple fibers having a linear density of 0.5 to 7 dtex (column 2, lines 44-52). With regard to claims 166 and 194, the twist of the strands may be 2 to 10 turns per cm (column 3, lines 35-40). With regard to claims 177-181, the linear density of the metal fibers and para-aramids may be as low as 0.5 dtex (column 2, line 14). With regard to claims 182-186, Zhu et al. do not disclose the denier for fibers made of nylon or cotton. However, adjusting the fineness of these fibers would be a matter of

optimizing a result effective variable that affects the feel and cut resistance of the fabric. It would have been obvious to one having ordinary skill in the art to use less than 0.1 denier fiber of the second type in order to create a fabric with the desired balance of feel and cut resistance, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. With regard to claims 188-190, Zhu et al. do not disclose the fineness of the yarns to exceed 60, 70, or 80 Cotton Count ore the weight per unit length to be less than 89, 76, or 66 Denier. However, adjusting the fineness of these fibers would be a matter of optimizing a result effective variable that affects the feel and cut resistance of the fabric. It would have been obvious to one having ordinary skill in the art to adjust the fineness of the fibers within the claimed range in order to create a fabric with the desired balance of feel and cut resistance, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. With regard to claim 191, the fibers may be made of spun staple fiber (column 2, line 19).

5. Claims 138-141, 143, 147, 149-154, 162, 167-169 are rejected under 35 U.S.C. 103(a) as being unpatentable over Land (U.S. Patent No. 6,146,759) in view of Howland.

Land discloses a yarn comprising fibers of a first type and fibers of a second type used to make a protective fire resistant garment (column 2, lines 32-45). Land fails to disclose the weave density of the fabric. Howland teaches densely woven fabrics useful in the manufacture of protective clothing (abstract). Howland discloses that improved penetration resistance is attained by weaving high modulus multi-filament yarns with a

cover in excess of 100% at the center of the fill yarn and in excess of 75% between two warp ends (column 2, lines 5-20). Howland does not disclose a "round packed cover factor" of 75% on the fill yarn and 26% on the warp yarn. However, "round packed cover factor" is only an alternative method for expressing the cover of a fabric. Since Howland already disclose densely woven fabrics, with a cover factor of up to 140% (column 4, line 59), the Examiner will assume that this cover value is in line with the "round packed cover factor" that the Applicant now claims. If not, it would have been obvious to a person having ordinary skill in the art to provide a fabric with the "round packed cover factor" that is claimed in claims 138-140, since doing so would simply be optimizing the density of the weave to provide a fabric with a desired penetration resistance. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. It would have been obvious to one having ordinary skill in the art to weave the fabric of Land with a fill yarn round packed cover factor of at least about 75% and a warp yarn round packed cover factor of at least about 26% in order to increase penetration resistance of the protective garment, as taught by Howland. With regard to claim 147, Land does not disclose a tensile breaking strength for the fiberglass filaments. However, Land teaches the filaments may be made from PPG (column 3, line 29) and uses an example where the glass filament is 198 denier (column 7, lines 1-2). Kolmes et al. teach that 200 denier fiberglass made by PPG is characterized by a high tenacity of 12 to about 20 grams per denier (column 7, lines 20-25). The Examiner thus asserts that the fiberglass filaments of Land would inherently have a tensile breaking strength of at least 10 grams per denier. With regard to claim

149 and 163, Land does not disclose the modacrylic fiber of the first sheath to also have a tensile strength of at least 10 grams per denier. It would have been obvious to one having ordinary skill in the art to use high strength modacrylic fiber with a tensile breaking strength of at least 10 grams per denier in the first sheath in order to increase the strength of the fiber. With regard to claims 150 and 151, Land discloses the second sheath may comprise cotton, nylon, polyester, polyolefin, and acrylic fibers (column 4, lines 1-5). With regard to claim 164, Land also does not disclose the number of fibers present in the fiber bundle. However, the total number of fibers present in the fiber bundle is also a result effective variable that would affect the size of the fiber. It would have been obvious to one having ordinary skill in the art to use between 60 and 100 fibers in the fiber bundle in order to provide a bundle with sufficient size for weaving into garments, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

6. Claims 138-141, 143, 144, 147, 148, 150-152, 154-157, 162, 164-191, and 194-198 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montgomery et al. (U.S. Patent No. 5,033,262) in view of Howland.

Montgomery et al. disclose a corespun yarn that comprises a high temperature core of aramid fibers and PBI fibers and a sheath of cotton or polyester (column 2, lines 1-19). The core and the core wrapper both extend primarily in the axial direction to impart tensile strength (column 2, lines 12-15). Montgomery et al. do not disclose the weave density of the fabric. Howland teaches densely woven fabrics useful in the manufacture of protective clothing (abstract). Howland discloses that improved

penetration resistance is attained by weaving high modulus multi-filament yarns with a cover in excess of 100% at the center of the fill yarn and in excess of 75% between two warp ends (column 2, lines 5-20). Howland does not disclose a "round packed cover factor" of 75% on the fill yarn and 26% on the warp yarn. However, "round packed cover factor" is only an alternative method for expressing the cover of a fabric. Since Howland already disclose densely woven fabrics, with a cover factor of up to 140% (column 4, line 59), the Examiner will assume that this cover value is in line with the "round packed cover factor" that the Applicant now claims. If not, it would have been obvious to a person having ordinary skill in the art to provide a fabric with the "round packed cover factor" that is claimed in claims 138-140, since doing so would simply be optimizing the density of the weave to provide a fabric with a desired penetration resistance. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. It would have been obvious to one having ordinary skill in the art to weave the fabric of Montgomery et al. with a fill yarn round packed cover factor of at least about 75% and a warp yarn round packed cover factor of at least about 26% in order to increase penetration resistance of the protective garment, as taught by Howland. With regard to claim 143 and 144, no structure is given to the fiber bundle in the claims, so the presence of many fibers would constitute a fiber bundle, as seen in Figure 1. With regard to claims 155-157, the core may comprise up to 25% by weight of the fiber, and Figure 1 appears to show the fibers of the core are of equal thickness as the fibers of the sheath. With regard to claim 164, Montgomery et al. do not disclose the number of fibers present in the fiber bundle. However, the total

number of fibers present in the fiber bundle is also a result effective variable that would affect the size of the fiber. It would have been obvious to one having ordinary skill in the art to use between 60 and 100 fibers in the fiber bundle in order to provide a bundle with sufficient size for weaving into garments, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. With regard to claims 165, 170, and 177-190 Montgomery et al. do not disclose the cotton count or denier of the fibers. However, adjusting the fineness of these fibers would be a matter of optimizing a result effective variable that affects the feel and cut resistance of the fabric. It would have been obvious to one having ordinary skill in the art to adjust the fineness of the fibers within the claimed range in order to create a fabric with the desired balance of feel and cut resistance, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. With regard to claims 166 and 194, Montgomery et al. do not disclose the primary twist of the fiber. It would have been obvious to one having ordinary skill in the art to provide the fibers of the yarn with a primary twist of at least 2.7 in order to stabilize the yarn for weaving into garments.

7. Claims 192 and 193 rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al. in view of Howland and further in view of Prickett (U.S. Patent No. 5,853,885).

Neither Zhu et al. nor Howland disclose using a Cotton System or a Worsted System. Prickett discloses using both the Cotton System (column 2, line 65) and the Worsted System (column 4, line 37) for spinning fibers in the manufacture of protective clothing. It would have been obvious to one having ordinary skill in the art to spin the

fiber bundles of Zhu et al. using the Cotton System or the Worsted System as a matter of obvious choice in production method, since both Systems are held to be known and common in the art.

8. Claim 148 is rejected under 35 U.S.C. 103(a) as being unpatentable over Land in view of Howland and further in view of Lilani (U.S. Patent No. 6,562,741).

Land does not disclose the core material to be para-armid, liquid crystal polyester, ultra-high molecular weight polyethylene, or PBO. Lilani discloses fire resistant fabrics are commonly made from para-armid or PBO. It would have been obvious to one having ordinary skill in the art to use para-armid or PBO in the fiber bundle of Land, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use. *In re Leshin*, 125 USPQ 416.

9. Claims 192 and 193 rejected under 35 U.S.C. 103(a) as being unpatentable over Land in view of Howland and further in view of Prickett.

Neither Land nor Howland disclose using a Cotton System or a Worsted System. Prickett discloses using both the Cotton System (column 2, line 65) and the Worsted System (column 4, line 37) for spinning fibers in the manufacture of protective clothing. It would have been obvious to one having ordinary skill in the art to spin the fiber bundles of Land using the Cotton System or the Worsted System as a matter of obvious choice in production method, since both Systems are held to be known and common in the art.

10. Claims 192 and 193 rejected under 35 U.S.C. 103(a) as being unpatentable over Montgomery al. in view of Howland and further in view of Prickett.

Neither Montgomery et al. nor Howland disclose using a Cotton System or a Worsted System. Prickett discloses using both the Cotton System (column 2, line 65) and the Worsted System (column 4, line 37) for spinning fibers in the manufacture of protective clothing. It would have been obvious to one having ordinary skill in the art to spin the fiber bundles of Montgomery et al. using the Cotton System or the Worsted System as a matter of obvious choice in production method, since both Systems are held to be known and common in the art.

Response to Arguments

11. Applicant's arguments with respect to claims 138-198 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy R. Pierce whose telephone number is (703) 605-4243. The examiner can normally be reached on Monday-Thursday 7-4:30 and alternate Fridays 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (703) 308-2414. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Jeremy R. Pierce
Examiner
Art Unit 1771

August 25, 2003

ELIZABETH M. COLE
PRIMARY EXAMINER